SUMMARY

A. Study Purpose and Federal Action

This Draft Environmental Impact Statement (DEIS) has been prepared to provide information for federal actions by the Federal Highway Administration (FHWA) and the U.S. Army Corps of Engineers (USACE). These actions will allow the FHWA to issue a Record of Decision for the U.S. Route 20 project and allow approval or disapproval of a Clean Water Act Section 404 Permit by the USACOE.

This DEIS evaluates the potential environmental impacts resulting from the construction and operation of the proposed roadway improvements along U.S. Route 20 (FAP 301) in Jo Daviess and Stephenson Counties, Illinois. It presents a comprehensive analysis of the potential impacts associated with the proposed Expressway and Freeway alternates, inclusive of the No-Action or No-Build Alternate. It identifies the extent to which impacts to the environment may be anticipated and the degree to which potential impacts can be avoided or limited. Both beneficial and adverse impacts are identified and discussed in a qualitative as well as quantitative manner.

This DEIS has been prepared pursuant to the regulations of the National Environmental Policy Act (NEPA) of 1969 as amended, 40 CFR, Parts 1500-1508, and the Federal Highway Administration's Environmental Impact and Related Procedures (23 CFR 771). In particular, the DEIS has been prepared in compliance with FHWA Technical Advisory T 6640.8A, 1987 and the Illinois Department of Transportation (Department), Bureau of Design and Environment Manual (adopted on October 26, 1998).

The Notice of Intent (NOI) to prepare the DEIS for the U.S. Route 20 Improvements Project was published in the Federal Register on August 31, 1993 (see Appendix A).

B. Project Description and Project Setting

The proposed project will provide a high-type highway with an appropriate connection to the four-lane facility west of Illinois Route 84, northwest of the city of Galena, and extend 47 miles to the east connecting to a previously approved four-lane facility east of Bolton Road. Traffic on the eastbound and westbound lanes would be separated by a minimum 15.2-meter (50-foot) wide median. The proposed roadway would typically require right-of-way widths of a minimum of 91.2 meters (300 feet) to a maximum of 194 meters (640 feet). The actual right-of-way width would depend on the constraints at any given location. The project area and the Mississippi River crossing (Julien Dubuque Bridge) are the only remaining two-lane sections of U.S. Route 20 left to be studied for multi-lane improvements between Waterloo, Iowa and Rockford, Illinois.

The termini have been established so that U.S. Route 20 would function independently without forcing further improvements that may have impacts not addressed in the environmental studies, and so that the project would not restrict other future transportation improvements.

Under the Expressway Alternate, the alignment would generally follow the existing U.S. Route 20 alignment. However, it would incorporate the bypass of Galena (with a freeway cross-section) and the bypasses of Elizabeth, Woodbine and Stockton. Traffic on the eastbound and westbound lanes would be separated by a 15.2-meter (50-foot) wide median. An Expressway is defined as an arterial highway having two or more lanes for the exclusive use of traffic in each direction that may have partial control of access, which may or may not be divided or have

grade-separations (overpass or underpass) at intersections. Under the Expressway Alternate, there are two design Alternates.

Under the Freeway Alternate, U.S. Route 20 would be constructed as a four-lane freeway between Galena and Freeport. A Freeway is defined as a divided highway facility having two or more lanes for the exclusive use of traffic in each direction and full control of access. Traffic on the eastbound and westbound lanes would be separated by a 16.4-meter (54-foot) wide median. At various locations, the median varies in width, but does not exceed 25.5 meters (84 feet). Access would be provided at interchanges (always grade separated), including all state marked highways. All county roads, and most township roads, would be grade separated. The remaining township roads would be closed. Frontage roadways would provide access to existing homes, farmsteads, commercial or industrial operations or service drives.

The project area encompasses a region in northwestern Illinois that extends from Galena in Jo Daviess County to Freeport in Stephenson County. It is characterized by undulating terrain with steep ridges, narrow valleys and bedrock strata that lie close to the surface. The topography varies from gently rolling terrain, near Freeport, to nearly vertical valleys or canyon walls of 50 to 100 feet in the unglaciated area around Galena. Comprising nearly 750,000 acres of land, Jo Daviess and Stephenson Counties are continuing to experience strong commercial and residential growth, especially near Galena and the Galena Territory. Recent trends show that growth in the project area will continue at varying rates over the next decade. With the ongoing expansion of the resort industry and second homes, growth in all sectors of the Galena area economy is expected. This would result in further growth and expansion in the U.S. Route 20 corridor.

C. Purpose of and Need for Action

The purpose of the proposed action is to provide a transportation facility that properly addresses existing and projected system deficiencies and seeks to improve the safety and efficiency of the transportation system. This would include the high level of trips caused by increasing community and economic development within the area. The proposed improvements will integrate the needs of increased development, system capacity, travel safety, community access, and system continuity.

The need for the proposed project is based on several aspects of the currently inadequate transportation system. They include: regional economic characteristics, system capacity, safety concerns, community access, and system continuity.

- **Regional Economic Characteristics** - Increases in tourism and related activities, dramatic growth in the number of second homes, and shifts in employment trends in the southern and central regions of Jo Daviess County have resulted in a doubling of traffic on U.S. Route 20 over the past two decades.

- **System Capacity** - The need for a four-lane facility to serve Jo Daviess and Stephenson Counties was identified in the 1960s. Since then, travel demand along U.S. Route 20 in this

region has grown significantly. Measured in terms of Average Daily Traffic (ADT), travel demand along existing U.S. Route 20 has more than doubled on most segments between 1965 and 1995, despite the relatively stable population level. Traffic volumes on the westernmost sixty percent of the highway have grown during the period from 1985 to 1993, at an average annual rate of nearly 5.5 percent. The section of U.S. Route 20 between Illinois Route 73 and the city of Freeport has experienced a similar rate of growth. This growth in travel demand has increasingly affected traffic flow. This is particularly true during summer and fall weekends when additional travel demand by tourists and part-time residents frequently exceeds the roadway's capacity, resulting in extensive backups.

- **Safety Concerns** - Most of existing U.S. Route 20 (approximately 73 percent) between Galena and Freeport does not meet the Department's current design standards for a rural highway. Nearly 50 percent of the existing highway between Galena and Freeport is comprised of vertical and horizontal curves that do not meet the Department's current standards for a 90 kph (65 mph) design speed for rural highways[1]. In addition, more than 10 percent of this section has grades steeper than the maximum grade allowed for a roadway to remain in place. The Department's design criteria, based on the 90 kph (65 mph) design speed for a two-lane roadway, state that the maximum permitted vertical grade is 5 percent. According to current Department design standards for a two-lane roadway, passing sight distance (passing zones) should be available for at least 40 percent of a roadway's length. Along eastbound U.S. Route 20, passing zones account for only 34 percent of the roadway, while along westbound U.S. Route 20, passing is permitted along 37 percent of the roadway. Actual passing opportunities are available much less than these percentages due to the high volume of traffic. In addition, many of the at-grade intersections within the project limits have substandard turning radii, sight distances, grades and capacity. Shoulders adjacent to the majority of the existing U.S. Route 20 are either minimal or non-existent.

- **Community Access** - An overview of the existing road network shows that U.S. Route 20 is an integral part of the local road system, serving as a major link between many of the communities in both Jo Daviess and Stephenson Counties. The city of Galena, the Galena Territory, the various recreational resorts, and the villages of Eleroy, Lena, Elizabeth, Stockton and the township of Woodbine all provide employment and service opportunities to the residents of southern Jo Daviess and Stephenson Counties. As these communities continue to grow, the need for an improved and expanded roadway facility linking them becomes more important.

- **System Continuity** - The Department classifies U.S. Route 20 as a Major Arterial Highway within the rural State highway system. In general, major arterials are expected to provide a high degree of mobility and, therefore, should permit high operational speeds and direct routing to favor longer trip lengths. The 47-mile portion of U.S. Route 20 under study is the last remaining two-lane section of the highway between Waterloo, Iowa and Rockford, Illinois. The proposed project is needed to complete the missing four-lane section between Galena and the Freeport Bypass. Upon completion of this project and the Mississippi bridge at Dubuque, U.S. Route 20 would have continuous four-lane capacity through northwestern Illinois and northern Iowa from Rockford to Waterloo.

D. Project Alternates and Preferred Alternate (Alternate 2)

To meet the transportation needs identified for the U.S. Route 20 corridor, the alternates that are being evaluated in this DEIS include: (1) the No-Action Alternative and (2) two Build

[1]Minimum design criteria for existing geometric design elements allowed to remain.

Alternatives, an expressway and freeway, both of which would be constructed as four-lane facilities. The No-Action Alternative would include maintaining the existing federal, state, county and township roadways, and city streets located within the study corridor. The No-Action Alternative would fail to meet most of the items of the purpose and need statement. Under the No-Action Alternative, U.S. Route 20 would remain with its existing system continuity, poor geometrics, restricted capacity and passing movements, restricted access and resulting high crash-rate. A total of ten Freeway Alternates and two Expressway Alternates are being considered.

All of the Freeway and Expressway Alternates meet the project purpose and need by providing for adequate system capacity, community access, system continuity and improved travel safety. However, based on the social, economic, environmental and engineering design studies, input from the general public and the recommendations of the U.S. 20 Citizen's Advisory Council, the Department has determined that Alternate 2, the Long Hollow Freeway with the South Simmons Mound variation, best meets the purpose and need and is therefore the Preferred Alternate.

The determination of Alternate 2 as the Preferred Alternate by the Department is supported by the findings of the U.S. Route 20 Advisory Council Report to the Department dated September 6, 2001 (see Appendix G). In this document, the Advisory Council, through a unanimous decision, strongly recommended that the Department adopt the Long Hollow Freeway Alternate with the South Simmons Mound variation as its Preferred Alternate and that the Department present it as the Preferred Alternate at the public hearing.

E. Environmental Consequences

1. Social/Economic

The proposed project will result in the displacement of both farm and non-farm residences as well as commercial properties. Table S-1 presents the residences to be displaced for each alternate. All residential and business displacements will be conducted pursuant to the Uniform Assistance and Real Property Acquisition Policy Act of 1970 (as amended).

The proposed project will also result in the loss of revenue to local and county tax rolls. However, this loss is not considered to be significantly adverse nor will this tax loss place any hardship on the local community tax burden (see Table S-1). In most cases, any loss to the local and county tax rolls which would result will be offset by the benefits that will be realized in the form of increased locally-generated employment, material purchases and improved travel conditions.

The proposed project will result in economic benefits to the local and regional economies. These benefits, in the form of new short- and long-term employment, are expected to result from the construction of the proposed project. In addition, increased material purchases and increased expendable income generated from the construction of the proposed project, as well as increased sales taxes and property taxes, are anticipated. Table S-1 presents a summary of the economic impacts for each of the Alternates and the Preferred Alternate (Alternate 2).

The proposed project will also result in property and roadway access changes for non-farm and farm residences. Table S-1 also presents a summary of the roadway and access changes anticipated for each of the Alternates and the Preferred Alternate (Alternate 2).

Table S-1 Summary Matrix - Socioeconomics

It is not expected that the proposed project will adversely alter existing land use and development within the project area. The proposed project is considered to be consistent with the land use and transportation policies and objectives of the latest Jo Daviess and Stephenson County Comprehensive Plans as well as with the transportation policies and objectives of the Department for northwestern Illinois.

The proposed project will not result in the displacement of any community facilities that currently serve the project area, nor will it result in any disproportionate impacts to any minority or low income population groups within the project area.

The proposed project will introduce new interchanges and intersections along the project corridor, depending upon whether a Freeway or Expressway Alternate is constructed. The interchanges may have the potential for induced development, although local land use and floodplain ordinances and the control of utility extensions are mechanisms that could serve to promote or control development around or in close proximity to these interchanges.

2. Agriculture

The impacts to agricultural resources vary between the 12 Alternates. These impacts range from prime and important farmland, centennial farms, severed and affected parcels, and landlocked parcels to adverse travel, displaced farm residences and farm structures and agricultural income loss. These impacts are based on location and the length of the alternate. Table S-2 presents a summary of the agricultural impacts for each of the Alternates and the Preferred Alternate (Alternate 2). In general, there are more impacts in the western portion of the project area, primarily due to the rugged terrain. Some impacts vary greatly between the Alternates, such as hectares of landlocked parcels or the number of farm residences displaced (156 percent or 80 percent difference between lowest and highest impacted, respectively). Other impacts hardly vary, such as hectares of prime farmland or the hectares of right-of-way from agricultural resources required (10 percent or 11 percent difference, respectively).

3. Cultural Resources

Under the provisions of an agreement between the Illinois State Historic Preservation Officer, the FHWA and the Department, the professional cultural resources staff of the Department and FHWA have determined that the proposed project will have no effect on cultural resources subject to Section 106 of the Historic Preservation Act of 1966 as amended, or Section 4(f) of the Department of Transportation Act of 1966. Upon final selection of the Preferred Alternate, further archaeological studies will be conducted to determine the presence of sensitive archaeological resources and identify appropriate mitigation. Appendix E provides Section 106 coordination correspondence.

4. Air Quality

For Freeway Alternates 1 through 10, two separate areas were selected for modeling, while the Expressway Alternates were modeled at only one location in the village of Lena to identify the worst case scenarios. In Lena, the CO concentrations for all the Alternates are predicted to be lower than the No-Action Alternative. There is no significant difference in the predicted CO concentrations between the Expressway and Freeway Alternates. However, both the Freeway and Expressway Alternates are predicted to have a slightly beneficial effect on air quality within the area around Lena, with predicted levels below the eight-hour NAAQS for CO of 9.0 ppm.

TABLE S-2 AGRICULTURAL IMPACT SUMMARY

IMPACTS																
ALTERNATE	Length	Right-of-way from Agricultural Resources	Prime Farmland	Important Farmland	Soil Capability Classes (I & II)	Centennial Farms	Severed Parcels		Affected Parcels	Severance Management Zones	Landlocked Parcels		Adverse Travel	Farm Residences Displaced	Other Farm Structures Displace	Agricultural Income Loss*
	km. (mi.)	hectare (acre)	hectare (acre)	hectare (acre)	hectare (acre)	no.	no.	hectare (acre)	no.	hectare (acre)	no.	hectare (acre)	km (mi)	no.	no.	$1,000
1	76.7 (47.7)	1,059 (2,617)	334 (821)	453 (1,114)	392 (963)	3	114	7,691 (19,004)	74	71 (175)	35	227 (560)	213 (132)	30	97	$731
2	79.8 (49.6)	1,024 (2,530)	343 (842)	442 (1,087)	401 (986)	3	98	6,471 (15,989)	67	57 (142)	34	222 (548)	177 (110)	25	85	$709
3	80.5 (50.0)	1,047 (2,586)	359 (883)	557 (1,369)	416 (1,021)	3	103	6,983 (17,256)	72	73 (180)	35	255 (656)	155 (96)	32	99	$723
4	83.5 (51.9)	1,040 (2,570)	368 (904)	546 (1,342)	425 (1,044)	3	107	6,993 (17,281)	70	74 (184)	37	265 (654)	171 (106)	31	102	$719
5	79.6 (49.5)	1,122 (2,773)	343 (842)	547 (1,344)	399 (981)	3	105	7,533 (18,614)	80	71 (176)	29	172 (424)	195 (121)	29	90	$771
6	82.7 (51.4)	1,116 (2,757)	351 (863)	536 (1,317)	409 (1,004)	3	109	7,543 (18,638)	78	73 (181)	31	171 (422)	209 (130)	28	93	$766
7	78.2 (48.6)	1,087 (2,686)	361 (886)	512 (1,257)	417 (1,025)	3	101	7,283 (17,996)	79	68 (169)	29	168 (414)	193 (120)	27	88	$749
8	77.4 (48.1)	1,081 (2,670)	344 (845)	501 (1,231)	401 (985)	3	105	7,293 (18,020)	77	70 (173)	31	167 (412)	208 (129)	26	91	$745
9	81.3 (50.5)	1,066 (2,633)	369 (907)	500 (1,229)	427 (1,048)	3	110	7,681 (18,979)	76	69 (170)	33	227 (562)	198 (123)	31	94	$735
10	80.6 (50.1)	1,030 (2,546)	352 (866)	490 (1,204)	410 (1,008)	3	106	7,431 (18,361)	75	66 (162)	33	223 (552)	196 (122)	29	92	$713
11	76.7 (47.7)	996 (2,462)	344 (845)	471 (1,157)	405 (996)	0	110	6,453 (15,946)	85	59 (144)	38	370 (910)	209 (130)	45	125	$686
12	75.6 (47.0)	997 (2,464)	338 (831)	471 (1,157)	402 (987)	0	107	6,529 (16,133)	84	64 (157)	42	429 (1,055)	227 (141)	39	124	$686

Agricultural Income Loss = Agricultural Resources right-of-way in acres x annual cash receipt per acre (including livestock), where the year 2000 cash receipt per acre for Jo Daviess County is $251 and for Stephenson County is $379. The cash receipt per acres is equal to the crop cash receipts (including livestock) divided by the total farm acres.

* The Preferred Alternate is highlighted.

5. Noise

The Freeway and Expressway Alternates were modeled for the year 2020. Noise impacts were analyzed and future Build noise levels at representative receptor locations were modeled. The receptor locations with future Build noise levels of 66 dBA or more and/or having increases of more than 14 dBA over existing noise levels are considered to be impacted. Alternate 4 would have the largest number of impacts, while Alternate 1 would have the least number of impacts.

Mitigation measures include a range of considerations, including, but not limited to, the placement of noise barriers. Only two areas representing groups of six or more impacted sensitive receptors were identified within the project area. One area is located in the Galena Ridge subdivision in the vicinity of Evans Road along Alternates 11 and 12, while the other is located in the Galena Oaks subdivision between Read and East Center Roads along Alternates 3, 4, 7 and 9. The feasibility of placing noise barriers in these areas was analyzed and the results of the analysis indicate that noise barriers are not considered to be reasonable or feasible.

6. Natural Resources

6.1 Geology

Impacts to geological resources will be minimal. Proposed interchange approach ramps will abut the base of Horseshoe Mound, an Illinois Natural Area (geological feature), but the mound will not be impacted. No active gravel pits or quarries will be directly impacted. Although the Illinois State Geological Survey identified 26 wells within 200 feet of the centerline of the alternates, the 200-foot setback required by the Illinois Wellhead Protection Program is only relevant for routes or sources of groundwater pollution. Since the project will not introduce any new routes (dry wells or borrow pits) or sources (bulk road oil or deicing salt storage facilities), there will be no violation of the wellhead setback requirements. The replacement of pervious ground surfaces with impervious roadway surfaces will result in the loss of aquifer recharge area. However, the impacts to the aquifer system will be small and not adverse. Adverse impacts to groundwater quality are not anticipated. However, best management practices will be implemented during the construction and post-construction phases to ensure the greatest level of protection to groundwater quality. In karst terrains, groundwater is susceptible to contamination from stormwater runoff because of rapid recharge through open conduits. Stormwater runoff drainage designs will convey runoff to discharge points outside the vulnerable area, as necessary.

Bedrock and surface geology along the proposed alternate alignments place constraints on construction practices and project design. With the exception of Silurian dolomites, all bedrock units will provide a satisfactory subgrade. Due to the prevalence for Silurian dolomites to slide, any foundations in this unit will be located a sufficient distance from natural cliffs or benched road cuts. Rock excavation by blasting could produce new joints and fractures in bedrock as well as cause damage to human-made structures. Blasting operations, if necessary, will be controlled to prevent vibration impacts. Well-drained area soils will provide good to fair subgrades. The stability and settlement constraints posed by poorly drained soils will be overcome through appropriate design and construction techniques. Approximately 9,238 hectares (22,826 acres) of highly erodible soils, defined as soil with slopes of 4 percent or steeper, occur within the project area. The roadway will be placed to minimize soil cuts.

Benching of high cut and fill slopes is proposed, where necessary, to minimize soil erosion and long-term maintenance including sloughing. In areas susceptible to instability from karst

features present in underlying carbonate rocks, the roadway design will incorporate necessary remedial construction methodologies. In the areas surrounding Galena and Elizabeth, the alternates traverse areas with abandoned mines which may be susceptible to subsidence. Subsidence related to these mines will be overcome through appropriate design and construction techniques. Various surficial geological conditions in the project area are prone to slumping and landsliding. Stability will be considered in road design.

6.2 Surface Water Resources and Water Quality

Each proposed alternate includes 9 to 14 stream crossings. Attempts will be made during the preparation of design plans to minimize the disturbance to stream channels. In-stream construction work will include temporary access and dewatering structures. Appropriate measures will be taken to maintain near normal downstream flows and minimize flooding. Fill will be clean aggregate and placed in a manner that will not be eroded by expected high flows and will not cause more than minimal adverse effects on aquatic resources. Following completion of construction, affected areas will be restored to pre-project conditions.

During roadway construction, short-term increases in turbidity levels and sedimentation are anticipated. Levels within each stream should revert to background levels shortly after construction completion. To minimize impacts to aquatic biota and water quality, temporary and permanent erosion and sediment control measures will be implemented at sites with areas of exposed soils. Potential impacts to fish will be further reduced by conducting any in-stream work outside of the fish spawning periods, approximately April through July. It is unlikely that any federal or state listed endangered or threatened species of fish, mussels, other aquatic macroinvertebrates, or aquatic macrophytes will be adversely impacted by the proposed project.

Proposed crossings of the Apple River, a candidate National Wild and Scenic River, will consist of bridges spanning the river. The exact bridge foundation requirements will be determined following a geotechnical investigation. Depending upon the river conditions at the time of construction, cofferdams may be required. The final overall bridge lengths, number of spans and number and types of substructure units will be determined during the final design phase. The bridges will be designed to avoid and minimize impacts to the scenic and recreational values of the Apple River.

The only anticipated operational impact from bridged crossings is an increase in shading which may cause a vegetational shift toward a community dominated by more shade tolerant species. Culvert crossings have a greater potential to affect stream hydrology and erosion and sedimentation patterns. The potential for aquatic organisms to move through the stream system will be maintained by installing a culvert that accommodates a low flow channel and is at grade with the natural stream channel.

Studies by the FHWA indicate that pollutants in highway runoff are not present in amounts sufficient to threaten surface water or groundwater quality where the average daily traffic (ADT) is less than 30,000. The proposed alternates for this rural highway have a projected ADT from 11,600 to 20,000 in the year 2020. Therefore, only minor impacts, if any, are expected on the water quality of the receiving waters. Although it is not anticipated that increases in impervious surface area will adversely impact surface water quality, grassed medians, roadside ditches, and other features will be incorporated into the roadway design to reduce pollutant loading to nearby waterways.

Maintenance of the roadway will require the application of herbicides and deicing salts. Herbicide application rates will only minimally increase as a result of the proposed project. Based on data collected by the Illinois Natural History Survey (INHS), the background

concentration of chloride in project area streams varies from 5.21 mg/l in an unnamed tributary to Smallpox Creek to 42.55 mg/l in Tributary D of Yellow Creek, well below the IEPA water quality standard of 500 mg/l. It is unlikely that the deicing salt loading will adversely affect aquatic ecology of the project area streams.

6.3 Floodplains

Streams along the alternates will be crossed by either bridge structures or culverts. Proposed crossings of the Galena River, Smallpox Creek, Apple River, Furnace Creek, Wolf Creek, Yellow Creek, and Pecatonica River systems will encroach onto FEMA designated 100-year floodplains. In accordance with the intent of federal Executive Order 11988 on floodplain management, efforts have been made to minimize floodplain impacts. There are nine FEMA-designated floodplains in the project area. The Preferred Alternate has eight transverse crossings and one longitudinal crossing. The floodplain encroachments for each alternate are unavoidable. A summary of the impacts by Alternate is provided in Table 4-44. The project will not impact any regulatory floodways.

6.4 Wetlands

Most wetlands in the project area are composed of wet meadows, sedge meadows, and ponds with vegetated margins. Wet meadows and sedge meadows tend to be located at the headwaters of small streams and in abandoned channels of medium-sized streams. Most wet meadows and sedge meadows are located in pastures, because they are too wet to be cultivated. The greatest concentration of wet meadows, sedge meadows and marsh is in Irish Hollow, which also contains some of the larger wetland sites. The Galena River, Rush Creek, and Smallpox Creek watersheds also contain some relatively large wetland areas. Nearly all of the few sizeable floodplain forest sites are located along the Galena River. Most other floodplain wetlands are small in extent.

The Preferred Alternate (Alternate 2) has the least wetland impacts. This alternate impacts a total of ten wetland sites consisting of four different plant communities. The plant communities consist of four sedge meadows totaling 0.97 hectare (2.40 acres), four wet meadows totaling 0.25 hectare (0.62 acre), one marsh totaling 0.25 hectare (0.61 acre) and one pond totaling 0.01 hectare (0.02 acre). Alternate 1 has similar impacts as the preferred. Alternate 11 and 12 impact 26 wetland sites (13 wet meadows, 9 sedge meadows, 3 ponds and 1 marsh) totaling 6.4 hectares (15.81 acres) and 6.33 hectares (15.64 acres), respectively. Alternates 3 to 10 impact 13 to 17 wetland sites totaling between 3.45 hectares (8.53 acres) and 3.62 hectares (8.95 acres).

The majority of wetlands impacted by the alternates consist of wet meadows and sedge meadows. These wetlands are generally located in higher positions of intermittent drainages or first order streams. Many of these areas are within pastures, are subject to grazing, and have been degraded.

Wetland Mitigation

The Alternates were developed with the goal of avoiding and minimizing impacts to wetlands and stream channels while at the same time meeting the goals of the project. Wetland impacts have been minimized to the greatest extent possible at this stage of project design in a manner consistent with the project location criteria.

Wetland mitigation will be carried out by the purchase of the required credits from the Kilbuck Creek Wetland Mitigation Bank site just south of Rockford, Illinois. Bank sites are created

specifically for the purpose of wetland mitigation. Wetland banking provides for the consolidation of small wetland impacts into larger parcels, which have more ecological value and are more manageable.

At this point, it is anticipated that the Preferred Alternative will require the purchase of 8.69 hectares (21.48 acres) of wetland credits at this bank site to mitigate the impacts of the proposed project. All bank acreage will be purchased prior to construction of any part of the project impacting a regulatory wetland.

6.5 Special Waste

A Preliminary Environmental Site Assessment (PESA) was conducted by the Illinois State Geological Survey in 2001 along preliminary project alternates. This area was characterized as a high risk for the occurrence of hazardous materials. The PESA was updated in 2003 and is provided in Appendix F. Based on the review of available databases, it has been determined that the proposed project will not impact or involve any site included in the latest CERCLIS (February 12, 2003) listing by IEPA. A petroleum site with a regulated substance will be involved but since the project will not involve the excavation of contaminated soil, there is no impact.

6.6 Biological Resources

The Preferred Alternate (Alternate 2) will impact approximately 1,127.21 hectares (2,785.30 acres) of land. The range of impacts for the alternates is between 1,094 hectares (2,704 acres) of land (Alternate 12) and 1,200 hectares (2,965 acres) (Alternate 4) (see Table 4-38). The majority of the cover types that would be converted to roadway use by each Alternate consist of agricultural land (cropland), pasture, and hayfield. Combined with developed land, these cover types affect between 81 percent (Alternate 12) to 89.6 percent (Alternate 4) of the total affected area. These cover types represent disturbed areas that typically have a low diversity of native plant species. The major cover types important to wildlife affected by all alternatives include upland forest and wetlands (Section 4.9). There are patches of native grassland but these areas are too small to have much wildlife value. The plant communities within each individual area mapped (see Exhibits) along the alignments show signs of varying levels of past disturbance that has affected the species composition (native vs. non-native) and diversity.

In general, Alternates 1 through 10 impact the same amount of native grassland (0.65 hectare (1.6 acres)) and floodplain forest (1.4 hectares (3.4 acres)). Among the Alternates, differences are observable in the total amount of direct impacts to upland forest. The fewest impacts to upland forest are associated with Alternates 5 and 6 (98.2 and 97.9 hectares (243 and 242 acres), respectively), whereas the highest is associated with Alternates 7 and 9 (124 hectares (306 acres)). While impacts to upland forests occur throughout the project area, the majority of these impacts are associated with Alternate sections AB, BC, BD and BF, as these Alternates pass though the more extensive forested areas near Galena and Tapley Woods. East of Tapley Woods, upland forests impacted by the Alternates tend to be much smaller in size, generally less than 0.8 hectares (2 acres). The majority of the upland forest impacted by the alternates consists of young stands of trees of low quality that exhibit signs of disturbance from past logging and grazing.

Alternates 11 and 12 generally have similar magnitudes of impacts to the various cover types within the project corridor. The most notable difference is that these Alternates have the highest impacts to floodplain forest and native grassland, and the lowest impacts to marsh and wet meadow cover types. Both of these Alternates have nearly the same acreage of impacts.

Five sites identified during the field surveys, consisting of dolomite hill prairie, two mesic upland forest sites and two degraded mesic prairies, will be impacted to varying degrees by one or more of the alternates. All of the alternates will avoid direct embankment impacts to the dolomite hill prairie; however, approximately 0.4 hectares (0.99 acres) will be within the ROW and efforts to avoid secondary impacts to prevent encroachment during construction will be necessary. One of the mesic forest sites is associated with the Tapley Woods Land and Water Reserve. While none of the Alternates will directly affect Tapley Woods, Alternates 7 through12 will pass south of Tapley Woods through adjoining forest and directly impact approximately 2.08 hectares (5.13 acres) of upland forest.

Wildlife impacts were assessed from the standpoint of construction impacts and subsequent use of the proposed highway. Construction of any one of the proposed Alternates will result in impacts to wildlife through the loss or alteration of existing habitat, the fragmentation of existing habitat, potential disruption of wildlife movement, and mortality during construction and subsequent roadway use (vehicle-wildlife collisions). These impacts will mostly occur to wildlife species that are common within the project area. Potential impacts to common wildlife species are anticipated to be higher for the Freeway Alternates than the Expressway Alternates since the latter closely follow the existing U.S. Route 20 corridor. The Freeway Alternates will result in the construction of entirely new roadway through mostly open country while the existing U.S. Route 20 would remain as currently designed.

Fragmentation

Fragmentation of forests will occur in varying degrees along each Alternate. Sections BC, BD and BF, common to one or more of the alternates, will fragment a 350-acre upland forest located just west of the Tapley Woods Land and Water Reserve. Approximately 26 acres of interior forested area will be lost and approximately 6300 linear feet of edge would be created. These impacts will result in the loss of Neotropical migrant and bird-breeding habitat and allow for greater predation to nesting birds within the remaining forested areas. Area sensitive breeding birds such as vireos, ovenbirds, thrushes and warblers would be affected. Other woodland dependent birds such as hawks and owls will be affected by the loss of available habitat, however, because of the larger home range associated with predatory bird species, and the loss of only relatively narrow corridors within these established forests, only a minor negative impact is expected. Likewise, transient bird species will not be appreciably affected by the construction of a new roadway. Certain buteos, such as red-tail hawks, frequently utilize highway right-of-ways for hunting and will adapt to using the available habitats within the right-of-way.

No wildlife corridors were identified within the project area. The construction of any one of the proposed Alternates will affect the movement patterns of larger mammals within this area. Bridged stream and river crossings will maintain several wildlife movement corridors within the project area. An equal number of these crossing are proposed for each alternate. In addition, culverts will be incorporated into the design of the Preferred Alternate to accommodate wildlife passage.

Wildlife mortality due to wildlife/vehicle collisions will occur under each alternate. Conversion of sections of the existing 2-lane U.S. Route 20 to a multi-lane roadway under the Expressway Alternates (11 and 12) would result in a reduction in wildlife/vehicle collisions for some road segments since multi-lane roadways tend to act as barriers to wildlife and discourage their movement. The Freeway Alternates would most likely result in an increase in wildlife/vehicle collisions due to an increase in lane miles along a new corridor and the continued operation of a 2-lane U.S. Route 20. However, it is not known whether the rates of vehicle/wildlife crashes will increase significantly beyond current levels. It is likely that a slight rise in the number of

wildlife/vehicle collisions will occur with the increase in lane miles and traffic levels anticipated in the future.

Additional impacts to some wildlife species will be caused by the noise created by vehicles during construction and subsequent roadway operation. Generally, the subsequent use and maintenance of the roadway will reduce the value of adjacent habitat, even in areas where vegetation will not be removed and where it will be replanted. However, many wildlife groups readily adapt to new noise levels and patterns of activity. Studies have shown that the introduction of roadway noise can cause a varying degree of reduction in breeding bird densities within 250 meters (820 feet) of a roadway.

Threatened and Endangered Species

Within the project corridor, only one state-listed species of wildlife has the potential to be impacted by the proposed project. A significant population of the state-endangered timber rattlesnake was identified in the project corridor. Timber rattlesnakes move away from their dens sites in spring and back to them in the fall. It has been recommended (Brown 1993; Phillips 1999) that an area 2.4 km (1.5 miles) in radius around a den should be safeguarded to protect a viable population of timber rattlesnakes. In addition, a buffer zone of 1.6 km (1.0 mile) beyond this is recommended where some human incursion is allowed. These alignments do encroach upon the buffer zone depicted on Figure 2-12. We have incorporated the following measures to minimize harm to the timber rattlesnake. Based on these considerations, the Preferred Alternative will not impact the timber rattlesnake. The Preferred Alternate (Alternate 2) and other Alternates are not anticipated to affect active den sites for this species. The Preferred Alternate (Alternate 2), Alternate 1, and Alternates 7-12, which utilize Sections BC or BF, will put the proposed roadway beyond the edge of the range of the timber rattlesnake and over 2.0 miles from any known hibernaculum. Alternates 3 through 6, which utilize the Section BD alignment, would pass closer to the center of the timber rattlesnake's range and within 1,000 feet of a hibernaculum. Therefore, the proximity of the Section BD alignment to existing timber rattlesnake habitat may result in an impact to a population of this species.

Table S-3 provides a summary of the impacts to natural and biological resources by Alternate.

7. Visual/Aesthetics

There are three distinct landscape types within the project corridor. These include: upland ridges and hollows, which are found between Galena and the township of Woodbine, rolling hills and valleys, which are found between Woodbine and the village of Stockton, and Illinois prairie, which is found east of Stockton. The Visual Impact Analysis identified four Visual Resource Classifications associated with the project corridor. The highest quality visual resources (Class One) are found in the area between Galena and Woodbine, more moderate visual quality resources (Class Two and Class Three) are found between Woodbine and Stockton and the remainder of the project corridor has the lowest visual quality (mostly Class Four).

The Visual Impact Analysis concluded that the proposed project, with appropriate landscaping, structural and roadway design can be constructed in such a manner as to limit the potential for any significant or adverse long term impacts to the existing aesthetic qualities of the project area. Visual impact reduction recommendations as identified in this DEIS will be incorporated into the final design to ensure that the selected alternate will function as a component of the natural landscape and that all possible measures will be employed to enhance the views of the road and views from the road.

Table S-3 Natural/Biological Resources – Summary of Findings

8. Construction Period Impacts

Construction period impacts related to the proposed project could include traffic detours, utility relocations and temporary storage of construction materials and equipment. In addition, construction may cause short-term air quality and noise impacts. Best Construction Practices with the latest Department *Standard Specifications for Road and Bridge Construction* will be employed to limit any short-term impacts. Coordination among the Department, local and county engineering personnel, and public safety officials will serve to limit any long term adverse impacts to local circulation and travel patterns within the project area.

9. Cumulative and Secondary Impacts

The proposed project is not expected to result in any significant secondary or cumulative impacts. Although the proposed project may influence the timing of planned and programmed developments within the project area and nearby region, it is not expected to result in any unanticipated induced development.

F. Areas of Controversy

The alternates studied in this DEIS have been the subject of some controversy. The issues reflect the differing views of the community over appropriate solutions to traffic congestion and safety, access to local communities, highway system continuity, support for economic development and the impacts on the human and natural environment. These issues were the focus of a comprehensive program of public meetings and citizen advisory councils and work group activities, all of which involved significant public input. While the results of this public involvement served to identify appropriate alternative alignments for the Freeway and Expressway Alternates, as well as local perspectives on regional effects, they also provided the foundation for ongoing consensus-building among the various communities and groups in the project corridor.

At this time, there are no known local or agency-related subjects of controversy or unresolved issues associated with the proposed project. Although the proposed project will result in the displacement of some residential and commercial properties and impacts to wetlands, habitat areas, agricultural properties, noise sensitive receptors and project area viewsheds, none of these issues have continued as subjects of on-going controversy with the public or regulatory agencies. Mitigation and appropriate compensation measures have been incorporated into the cost and design of the proposed project to limit any long term adverse impacts.

G. Types of Permits

1. Federal

Section 404 Permit

Certain activities in the streams and wetlands of the project area may require a Section 404 permit from the U.S. Army Corps of Engineers (USACOE) for the discharge of dredged or fill material into waters of the United States.

2. State

Section 401 Water Quality Certification

All Section 404 permits require a Section 401 Water Quality Certification review by the Illinois Environmental Protection Agency (IEPA). IEPA's regulations will need to be consulted to approve or waive the water quality certification as a condition for issuance of an individual Section 404 permit or use of a nationwide Section 404 permit.

Section 402 National Pollutant Discharge Elimination System Construction Permit

This project will result in the disturbance of two or more hectares (five acres) of total land area. The current threshold for disturbance is .041 hectares (1 acre). Accordingly, it is subject to the requirement of a Section 402 National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from construction sites. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit.

Construction in Floodways of Rivers, Lakes, and Streams Permit

A permit for construction in regulatory floodways and public waters will need to be obtained from the Illinois Department of Natural Resources, Office of Water Resources. This permit is required for construction in the floodway of streams serving a tributary area of 259 hectares (640 acres) or more in an urban area or 2,590 hectares (6,400 acres) or more in a rural area.

Groundwater Management

Project related activities may be restricted in regulatory setback zones. IEPA has jurisdiction over setback zone restrictions and will need to be consulted regarding applicability for this project. Proposed project related activities may be considered new potential sources of contamination. Waivers and exceptions to minimum setback zone prohibitions can be acquired.

Demolition of Structures

IEPA requires notification of demolition and renovation of structures. As there will be building displacements under either alternative, this permit would be required.

State Historic Preservation Office Approval

Archaeological and historical surveys were conducted as part of the project compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (see Appendix E).

3. Local

Groundwater Management

Local communities enforce nonregulatory groundwater management practices such as activity restrictions within Wellhead Protection Areas and zoning ordinances. Local communities will need to be consulted regarding applicability for this project.

Table S-3 presents a summary of the types of permits that will be required, by each Alternate.

H. Public Involvement

1. Comments and Coordination

a. Approach

The citizens of Jo Daviess and Stephenson Counties have been discussing the development of a four-lane highway in the region for decades. In the 1960s, local interest spurred a four-lane highway corridor study by the Department in the northern portion of the two counties. But with community growth progressing mainly along the existing U.S. Route 20 corridor in the southern portion of the two counties, a new highway corridor study was needed.

In addition, with passage of the National Environmental Policy Act of 1969, the Department had to revise its study procedures to include the preparation of an Environmental Impact Statement. But citizen interest remained high, with 13,000 individuals signing a petition to the Governor in 1985 seeking the construction of a four-lane highway. Finally, pressure from a local Congressional representative and other individuals secured federal funding for the Department to conduct an engineering design study and Environmental Impact Statement under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

The U.S. Route 20 Engineering Design Study and DEIS, begun by the Department in 1993, afforded the citizens of Jo Daviess and Stephenson Counties the opportunity to compare the need for the highway with its anticipated socio-economic and environmental impacts.

With the comprehensive review and evaluation of regional needs necessitated by the proposed project, the Department utilized a process of public involvement, dialogue and strategic planning in which issues and concerns were identified and often resolved employing community relations, interest-group facilitation and consensus-building techniques. The Department fostered communication among outside interests and the state to assure that concerns were heard and responded to during the project study.

The Department structured public dialogue by facilitating the development of five regional Work Groups made up of local citizens to discuss issues affecting agriculture, economic development, environment, government and tourism. In addition, an umbrella U.S. Route 20 Advisory Council (Advisory Council), made up of the chairperson and one other individual from each work group, represented these regional interests and provided input to the Department on the impacts of alternate four-lane highway alignments. Other special interest groups formed independently in the region, choosing to remain outside the work group structure while participating in the Department public involvement dialogue process.

b. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 1994, requires federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse socio-economic effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Concentrations of low-income or minority populations were not identified during field visits, and a review of census data thus determined that no Environmental Justice impacts are imposed on populations in the project area.

2. Major Issues of Concern and Consensus

■ *Impact Assessment Criteria*

Each U.S. Route 20 Work Group identified primary issues of concern or criteria for gauging the impact of a four-lane highway on their area of interest. The outcome of their criteria evaluation is discussed in Section 5.0 and Appendix G. The Agriculture Work Group was concerned about farm splitting, disruption of local access, loss of prime and important farmland, displacement of farm homes and working structures, and mixing of farm traffic with commercial and tourist traffic.

The Economic Development Work Group focused on providing the safest route for business travel, retaining jobs and business operations, maximizing the creation of new jobs and businesses, and separating local business traffic from through traffic. The work group also was concerned about the impact of bypasses on local communities.

The Environment Work Group focused on preserving natural areas, minimizing pollution, protecting endangered and threatened species and their habitats, and preserving and protecting scenic areas and the uniqueness of the driftless (unglaciated) region.

The Government Work Group criteria included providing good access to local communities; limiting impacts on emergency services, local government economics, infrastructure and maintenance of local roads and overpasses; and ensuring compatibility of the highway with local land-use plans.

The Tourism Work Group criteria focused on providing access to and preserving local businesses, preserving tranquility, scenic views and unique terrain, encouraging recreational tourism, servicing the transportation needs of tourists and the local population and preserving the area's historical character, local charm and wildlife.

At the conclusion of the study, each work group developed a report summarizing the impacts of each alignment on its particular interest area. Work group members utilized their own value scales (weighted criteria) with the Department technical study data to identify the alignment(s) with the least impacts.

The Advisory Council developed additional impact assessment criteria independent of the work groups, including: traffic safety, future highway needs, the local highway system, construction under traffic, and the costs of construction and maintenance. Members also discussed regional economic development issues, build versus no build alternatives and system continuity, developed a report summarizing impacts on the region as a whole and recommended to the Department which alternates would best serve the area. The findings of the Advisory Council are provided in Appendix G.

3. Advisory Council Selection of Locally Preferred Alternate

The Department has found that while all of the Build Alternates provide for adequate system capacity, community access, afford system continuity and address safety concerns, the Freeway Alternates provide a greater degree of safe travel through the project corridor than do the Expressway Alternates, due to the introduction of grade-separated interchanges. The Department's crash data supports the consensus and recent research that grade-separated interchanges provide a greater level of safety than at-grade and signalized intersections, such as those that would be constructed with the Expressway Alternates.

The Advisory Council determined that environmental considerations were very important, due to the concerns of natural resource and agriculture agencies and the legal standing in current law afforded threatened and endangered species and natural areas. The Advisory Council also believed that recommending an alternate that impinges more harshly on these areas could result in a legal challenge and halt progress on building a four-lane highway in the region.

Since farmers would have to give up the most land for a new four-lane highway, the Advisory Council considered their preferences to be very important as well. From a land-use planning standpoint, the Advisory Council determined that choosing an alignment north of Elizabeth would best facilitate local growth and development contiguous to Elizabeth on the west and north and keep development centered in the Illinois Route 84/U.S. Route 20 corridor.

Regarding the needs of the Galena Territory, the Advisory Council members felt that most of the Freeway Alternates would adequately serve these residents' needs. They noted that, previously, the Department had taken into consideration the desires of the Galena Territory not to have an interchange at its back entrance and to move proposed interchanges away from its front entrance.

Thus, the Advisory Council unanimously agreed that Alternate 2, the Longhollow Freeway Alternate with the South Simmons Mound variation, would best accommodate the interests of the most individuals and communities of the region. The Advisory Council was able to reach this consensus with the understanding that it would support the mitigation issues raised by each Work Group and that the Department would take progressive and proactive steps to preserve the scenic beauty and protect the ecosystems of this area.

The Advisory Council Report to the Department, dated September 6, 2001 is provided in Appendix G.